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Varicocele and Infertility in Men

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Varicocele is an important cause of infertility in men. The exact mechanism by which varicocele depresses spermatogenesis is unknown but probably the retrograde flow of blood rich in catecholamines into the testes plays a major role.

Because subfertile semen qualities are present in a large percentage of men with varicocele and because the response to surgical procedures is very good, high ligation of the left internal spermatic vein is recommended in men with varicocele and infertility.

IT IS NOW generally accepted that varicocele can cause impairment in spermatogenesis and that ligation of the left internal spermatic vein results in pronounced improvement in semen quality. The results reported here confirm these facts.

Materials and Methods

Between July 1973 and June 1975, a total of 57 patients with varicocele were referred to the Urology Clinic at the American University Medical Center. In all 57 patients at least one semen analysis was made and in 49 out of 57 cases there were abnormal findings on a spermogram. A spermogram is considered abnormal if the count is less than 20 million sperms per ml, if the motility is less than 50 percent at two hours, if there are more than 50 percent abnormal forms or any combination of these three measures.

A breakdown of the cases is found in Table 1. Of the 57 patients, 37 were referred for infertility, spermograms were abnormal in all, and 20 were referred because of the presence of a varicocele, spermograms were abnormal in only 12 of these. A profile of all semen analyses done on all 57 patients is shown in Table 2.

Of the 49 patients with varicocele and abnormal spermograms, 39 were treated surgically. The operation consisted of transection and ligation of the transected ends of the left internal spermatic vein at the level of the internal inguinal ring through a left inguinal incision. There were no postoperative complications and the average length of hospital stay was 2.5 days. All patients were back to their normal activities within eight days.

Results

Of the patients, 37 were followed up for periods ranging from 5 to 14 months and 2 patients were lost to follow-up. Pronounced improvement in semen quality was noted in 27 of the 37 patients. A spermogram is considered improved when all three measures—count, motility and morphology—become within the normal range. Table 3 shows a profile of the semen analyses done on all 37 patients before and after ligation of the spermatic vein.

Table 4 breaks down the cases according to the preoperative sperm count. In all 37 patients there was low motility and a high percentage of abnor-

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mal forms whether the count was over or under 20 million sperms per ml. Of the 19 patients with counts over 20 million per ml, 18 improved; 8 of 12 patients with counts between 10 and 20 million per ml improved, and only 1 of 6 patients with counts less than 10 million per ml showed improvement postoperatively.

TABLE 1.—*A Breakdown of 57 Patients with Varicocele*

	Total Number of Cases	*Number of Cases with Abnormal Spermogram*
Patients with varicocele referred for infertility	37	37
Patients referred because of presence of varicocele	20	12
TOTAL	57	49

TABLE 2.—*Findings on Semen Analysis in the Presence of Varicocele*

	Patients with Varicocele and Normal Spermogram	*Patients with Varicocele and Abnormal Spermogram*
Number of patients	8	49
Number of semen analyses done	14	102
Volume of ejaculate (ml)	3.7	3.4
Sperm count (millions per ml)	62	16
Total count (millions)	229	54
Motility		
Actively motile	63%	41%
Sluggishly motile	31%	34%
Dead	6%	25%
Morphology		
Normal forms	72%	52%
Abnormal forms	28%	48%

TABLE 3.—*Findings on Semen Analysis of 37 Patients Before and After Ligation of Spermatic Vein.*

	Before	*After*
Volume of ejaculate (ml)	3.4	3.5
Sperm count (millions per ml)	18	42
Total count (millions)	61	147
Motility		
Actively motile	39%	59%
Sluggishly motile	37%	24%
Dead	24%	17%
Morphology		
Normal forms	53%	68%
Abnormal forms	47%	32%

TABLE 4.—*Results of Ligation of Spermatic Vein on Semen Quality in 37 Patients*

Sperm Count (millions/ml)	*Number of Patients*	*Number Improved*	*Percent Improved*
More than 20 million	19	18	95
Between 10 and 20 million	12	8	67
Less than 10 million	6	1	17
TOTAL	37	27	73

Discussion

In the past, men with varicocele were treated by suture ligating the pampiniform plexus of veins in the inguinal canal at two levels and tying the ligatures together. But surgeons often refused to operate on the basis that the condition is self-limiting, that the symptoms were trivial and were not relieved by the operation, and that the operation sometimes resulted in atrophy of the affected testis.[1] Since the investigation by Russell[2] between 1947 and 1954 and the report by Tulloch[3] in 1952 of the restoration of fertility in an azospermic man after varicocele ligation, fresh thinking has been devoted to this subject.

The pathogenesis of subfertility associated with varicocele is not known. A varicocele develops as a result of the absence or incompetence of the valves of the left internal spermatic vein, particularly the valve at the junction of the spermatic and left renal vein,[4,5] causing retrograde flow of blood from the renal vein down the spermatic vein into the pampiniform plexus and, through cross-collateral venous communications, to the opposite side.[4] Therefore, any factor affecting spermatogenesis of the left testis will affect the right testis as well.

Whether the insult to spermatogenesis brought about by the presence of varicocele is due to a disturbance in thermoregulation[6,7] or whether it is due to increased adrenal steroids[5] and catecholamines,[8] there is histologic evidence of bilateral spermatogenesis arrest[9] which is corrected by ligation of the left internal spermatic vein. Clinically, this is manifested by improvement in semen quality in a good number of men.[5,10-12] In this series the overall improvement was 73 percent.

Although the incidence of varicocele has never been accurately determined, it is generally believed that 10 percent of men between the ages of 20 and 40 years have varicoceles. How many of these will be infertile is not known. In this report, of the 20 men seen because of a varicocele discovered on routine physical examination, in 12 spermograms were abnormal, making the incidence of subfertile semen quality in men with varicocele 60 percent. Three of the remaining eight patients with varicocele and normal findings on analysis of semen were followed up for six months to one year and in one of the three patients semen quality dropped to below the normal

fertile levels, increasing the subfertility incidence to 65 percent.

From the study of this group of men with varicocele it seems reasonable to assume that varicocele is uniformly detrimental to spermatogenesis, and the fact that some men with varicocele are fertile should not minimize the potentially detrimental role of this abnormality.

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Equating Anxiety and Low Blood Sugar

I think what's going on in our "epidemic of hypoglycemia" is as follows: the prevalence of low glucose values is great; the prevalence of anxiety, neuroses and psychosomatic symptoms in our population is also very great. Many patients are desperately seeking an organic basis for their symptoms. There is a certain similarity in the symptoms of hypoglycemia and of anxiety. In anxiety there is an epinephrine discharge, in hypoglycemia there is an epinephrine discharge. So there is a sort of physiological reason to have this similar array of symptoms. And we have a situation in which a lot of anxiety is occurring and a lot of low blood glucose values are being seen; we are starting to equate the two. And in my view, that is not valid.

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